User Manual of

Custom Backup Power Supply 12v 26Ah (CU-MM125 PID# 5105)

AA Portable Power Corp

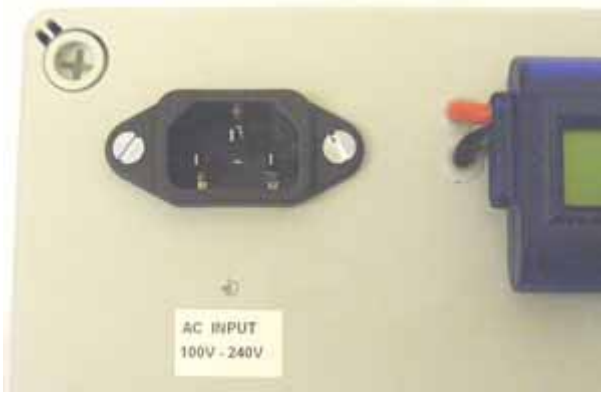
AA Portable Power Corp (http://www.batteryspace.com)
Address: 860 S, 19th St, Unit A, Richmond, CA, 94804
Tel: 510-525-2328
Fax: 510-439-2808
Email: Sales@batteryspace.com
Prepared & Approved by Louis (01/10/10)

IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS

- Never make wrong polarity connection when charging and discharging battery packs. Always double check polarity of battery& connector to make sure red wire to red wire and black wire to black wire.
- Please always use a smart charger (with automatic power cut-off function) to charging NiMH battery, charging NiMH battery without an attention may cause battery explode.
- When charging NiMH battery, please always put the battery in a wire-proof place to avoid any accident happen.
- Please always following specification listed on our web page to charging and discharging NiMH battery.
- For larger battery pack (10Ah or larger) , please always use a smart charger with temperature sensor to avoid over heating which may cause the accident. NiMH batteries have higher energy than NiCd battery, but they have higher self discharging rate and shorter shelf life. Therefore, please always keep NiMH cells / battery pack in charged condition after using or before storing them.
- Suggest you charging NiMH batteries and packs at least every six months, otherwise NiMH battery will reduce capacity or dead. For safety reason, we usually ship NiMH battery without fully charged. You must charging NiMH battery before use, and allow 3-5 cycles of charging and discharging for battery capacity to be recovered.

Front Panel Explanation

1 = LED status
Red = Charging Battery
Green = Ready to use
2 = AC Input 100-240VAC 60 Hz



3 = Watt's up Meter

4 = Power on off switch
Position 1 = On
Center = Off
Position 2 = ON
Note: Position 1 & Position 2 are the same

5= Output 175W (Do not overload)

"Watt's Up" Watt Meter and Power Analyzer

Measures EIGHT parameters key to electric power safety & performance.

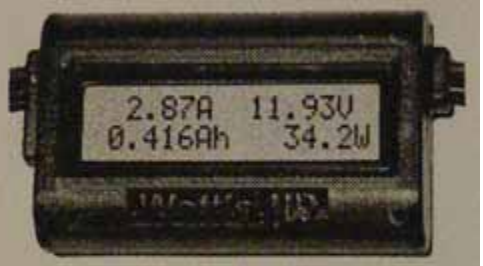
Use it to: Prevent peak currents damaging battery, motor control, motors, wiring and connectors. Verify sufficient operating voltage under load. Set cutoff voltages, check battery capacity & health. Balance battery cells. Confirm proper battery charger operation. Detect stalled servos. Compare and select components for best performance and much more!

KEY FEATURES (visit our website for more information)

- **Measures: charge (mAh), Amps (A), Voltage (V), Watts (W) and energy (Wh) with peak currents up to 100 A at 60 V**
- **Measures peak Amps, peak Watts and minimum Volts (sag)**
- Easy to use and no computer is required.
- 1% typ. accuracy & precise with 0.01 A and 0.01 V resolutions
- Aux. connector allows meter reset and measurement down to 0 V
- Small & light: 2.8" L x 1.7" W x 0.83" D, 2.3 oz.
- Heavy gage, super-flex, stranded, high-temp silicone insulated wire
- Doesn't affect measured circuit's performance. Precision 0.001 Ohm current sensing resistor and circuitry that draws only 0.007 Amps
- Powerful, 8 MIPS microprocessor. Uses DSP to increase ADC resolution and differential measurement to increase noise immunity
- Rugged – Made in USA to ISO 9001 (test equip.) quality standards
- One-year warranty. Factory calibrated. Complete user's manual

SPECIFICATIONS (best combination of features and specs on the market!)

- Operates from 4 V-60 V. 0 V with optional auxiliary battery
- Measures 0-100 A peak, res. 0.01 A ; 0-60 V, res. 0.01 V; 0-6554 W, res. 0.1 W; 0-65 Ah, res. 0.001 Ah; 0-6554 Wh, res. 0.1 Wh
- 16x2, sharp LCD display



opt: Electric Blue

p/n: **WU100-B**

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"Watt's Up" BRIEF INSTRUCTIONS

1 SAFETY PRECAUTIONS

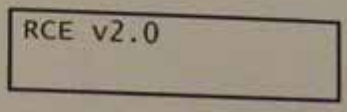
CAUTION: Shorting a rechargeable battery or a Watt's Up connected to a rechargeable battery can supply huge currents, causing fire, explosions, personal injury, and damage to equipment. Ensure that all wiring and connections are rated to handle the input or output current, and are properly assembled for each application.

1.1 Input Voltage & Current Handling Limitations

The Watt's Up is designed to be safe in systems using less than 60 V and carrying 50 A continuous, 100 A peak currents. ***CAUTION: Exceeding these limits will damage the Watt's Up and may cause personal injury.***

2 DISPLAY SCREEN

2.1 Startup Screen



Each time Watt's Up is reset or power is applied across the meter's leads (or auxiliary power connector) a startup screen with firmware revision number is briefly displayed and peaks, minimums, Ah & Wh are reset to 0. Then the display changes to the measurement screen.

2.2 Measurement Screen

The measurement screen continuously displays Amps, Volts and Watts. All **other measured values** are presented **sequentially, every two seconds,** in the **"Data-Queue"** position of the display. Data values are identified by their units (Ah, Wh, Ap, Vm, Wp). **All** measurement screen **values are updated every 0.4 seconds.**

The Measurement Screen layout: Amps, Volts, Watts & "Data Queue"

100.00A	10.00V
Data Queue	1000.0W

The "Data Queue" shows:
Ah, Wh, Ap, Vm, Wp in sequence.

2.2.1 (Current) Amps & Peak Amps A, Ap

Only current flowing through the black wires from LOAD to SOURCE is measured. Amps value displayed is the average current over the last screen update interval. **Peak** Amps value (Ap) displayed is the maximum current drawn from the LOAD side, since the meter's startup. Peaks lasting only a fraction of a second, can be captured. Watt's Up circuit operation draws a small current (7 mA) from the meter's SOURCE side

connections. This additional current can usually be ignored and the SOURCE side current be considered equal to the LOAD's current. Powering the auxiliary connector with a voltage ~1 V greater than the meter is measuring removes the meter's operation current from measurements.

2.2.2 (Voltage) Volts & Minimum Volts V, Vm

The displayed Volts value is the average voltage over the last screen update interval. The displayed **Minimum** Volts value (Vm) is the minimum voltage (or "sag") measured on the SOURCE side, since the startup screen ended.

2.2.3 (Energy) Watt-hours Wh

The displayed value is the total energy delivered in Watt-hours since the startup screen ended. It is measured on the LOAD side.

2.2.4 (Charge) Amp-hours Ah

The displayed value is the total charge in Amp-hours (x1000 = mAh) delivered since the startup screen ended. It's measured on the LOAD side.

2.2.5 (Power) Watts & Peak Watts W, Wp

The displayed value is the average power delivered in Watts (= Volts X Amps) over the last screen update interval. The displayed **Peak** Watts value (Wp) is the maximum power drawn on the LOAD side, since the startup screen ended. Watts values are measured on the LOAD side.

4 USING Watt's Up

You can connect the Watt's Up like a set of jumper wires and measure what they're connected to. Like jumper wires, the Watt's Up is essentially a direct connection (short) between same colored SOURCE and LOAD wires, i.e. both the SOURCE and LOAD leads are electrically "hot" when a battery is connected to either side. All current of the circuit to be measured must flow through meter's black wires in LOAD to SOURCE (forward) direction. Voltage to be measured must connect to either of the red wires (3-wire connection). Two red wires are provided as a wiring convenience for "jumpering" source to load terminals, but only one red is really necessary for the meter's measurements. **Reverse current flow in black wires is neither measured nor causes any damage**.

Example use #1: Battery on SOURCE side, Motor Speed Controller (ESC) and motor on LOAD side. With the ESC on, the Watt's Up shows the current into the motor, voltage and power at the battery and accumulates the Ah and Wh while the motor is running. **Example use #2:** with a battery charger on the SOURCE side and battery pack on the LOAD side, the Watt's Up shows the charging current into the battery, the voltage and charging power at the battery and accumulates the charge (Ah) and energy (Wh) into the battery.